Space Weather Forecast

Issued on Monday, 15 April 2024 at 01:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance G1/G2 on day 1 (15 Apr) from with any coronal mass ejection (CME) arrival, and perhaps day 3 (17 Apr) with a further CME arrival. Isolated Moderate flares likely.

Solar Activity: Moderate with one Moderate-class flare, from a small but magnetically unstable sunspot in the southeast. There are twelve sunspot regions visible, the largest in the northeast with some ongoing growth observed, including the development of a small reverse polarity spot near its trailer, leading to increased complexity. Growth was also observed in the trailer of a further spot near the northeast limb, another spot in the northeast, and a further spot to the northwest of this region. A new spot was also evident near the southeast limb.

A Common class flare from a simple sunspot in the southeast resulted in a faint coronal mass ejection (CME), which is still under analysis. Preliminary results suggest the potential for an Earth-directed CME arriving on day 3 (17 Apr), however confidence is low with the potential for the CME to be from an alternative, perhaps far-sided, source.

Solar Wind / Geomagnetic Activity: Solar winds showed the onset of weak fast wind enhancement from a coronal hole. Speeds increased from background to be slightly elevated, rising from around 330km/s to around 400km/s. Interplanetary magnetic field strength remained weak with the north-south component also only varying weakly. Resultant geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no Solar Radiation Storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate solar activity is expected, with a likelihood of further isolated Moderate flares.

Solar Wind / Geomagnetic Activity: There are up to three Earth directed CMEs. The first from an eruption on 11 Apr was low confidence for giving a glancing impact 14 Apr, and has yet to be observed, but could still arrive. The second is from a filament eruption on 12 Apr, also likely arriving early day 1 (15 Apr). This has high confidence for an arrival to occur, however due to being faint in imagery confidence is low with it's the strength. The third is the CME still under analysis from 14 Apr but may arrive on day 3 (17 Apr). Otherwise slightly elevated winds from any coronal hole onset are expected to ease day 2 (16 Apr) onward. Geomagnetic activity is expected to increase from Quiet to be Unsettled to Active with a chance of G1/Minor to G2/Moderate Storm intervals day 1 (15 Apr) due to the CME arrival. A decline in activity is then expected as the effects of these events wane, but with a chance of further Active to G1 Minor storms if any further CME arrival occurs on day 3 (17 Apr).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no Solar Radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	60	10	30	5
Strong	G3	No	5	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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